

BEUL



Ministry of the ENVIRONMENT

Report on

WATER POLLUTION SURVEY

COMMUNITY OF ARMSTRONG (UNORGANIZED)

DISTRICT OF THUNDER BAY

May 14 & 15, 1973

Sanitary Engineering Branch

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca

DISTRICT ENGINEERS BRANCH - FIELD INVESTIGATIONS

MUNICIPALITY - DISTRICT OF THUNDER BAY

DATE - May 14 & 15/73

COMMUNITY OF ARMSTRONG (UNORGANIZED)

MATTER INVESTIGATED - WATER POLLUTION SURVEY

REPORT BY - J. W. Gilhooly, Technologist AT REQUEST OF - Routine

DISTRIBUTION OF REPORT -

Mr. D. S. Caverly
Assistant Deputy Minister
Water Management

Central Records

Regional File

K. H. Sharpe
Executive Director
Water Supply and Pollution Control Division

J. R. Barr, Director
Sanitary Engineering Branch

C.E. McIntyre, Supervisor
District Engineers' Section
Sanitary Engineering Branch

Thunder Bay District Health Unit
P. O. Box 1034
Thunder Bay 'F', Ontario

Private Waste and Water Management Branch
1111 Victoria Avenue
Thunder Bay, Ontario

NO.	DATE PREPARED	DATE TYPED	TYPED BY	DATE APPROVED	DATE MAILED
		June 13/73	;af		

REPORT

MINISTRY OF THE ENVIRONMENT

Municipality Community of Armstrong (Unorg) Date of Inspection May 14 & 15, 1973
(Dist. of Thunder Bay)

Re: WATER POLLUTION SURVEY

Field Inspection J. W. Gilhooly Report by J. W. Gilhooly
Technologist Technologist

INTRODUCTION

A water pollution survey was conducted in the unorganized Community of Armstrong on May 14, 1973, for the purpose of determining and recording sanitary conditions as related to sewage disposal practices within the community, and the effects these practices have upon the north and south drainage courses (local creeks) which flow through the north and south areas respectively of the community.

A complete sanitary survey of drinking water supplies was not conducted at the time. However, samples were collected on a random basis for bacteriological examination and chemical analysis from various wells located in an area of the community in which a gasoline spill was reported to have occurred in late 1972.

GENERAL

The community was originally established as a result of CNR railway operations in the area. The community consists of approximately 115 homes and has a population of about 500 persons.

Reportedly, the population of the community has remained relatively static during the past several years.

The source of water supply for the majority of the homes consists of individual shallow dug wells. Some of these wells are shared by more than one family. Several of the wells were noted to be poorly constructed and inadequately covered to prevent surface water and debris from gaining access to them.

Reportedly, the C.N. railway water works system serves the C.N. buildings, O.P.P. quarters, the local curling rink and approximately four homes in the vicinity of the C.N. station. The only form of treatment for the water supply is chlorination.

There are no sanitary sewers within the community. Sanitary wastes are disposed of on an individual basis by means of septic tank and tile field systems or pit privies.

OBSERVATIONS

All of the roads throughout the community are gravel with storm runoff being directed to the local roadside ditches. At the time of the field inspection, all of the roadside ditches throughout Armstrong were dry. Although many of the ditches contained litter and debris there were no visible signs of septic tank effluent or raw sanitary wastes.

Soil conditions in Armstrong consist of a mixture of coarse sand and gravel. It appears that the absence of cohesive soils in the community accounts for the relatively large permeability of the overburden.

These conditions are, of course, very satisfactory from the point of view of allowing septic tank and tile field systems to function in a proper manner. However, the small lot sizes and the corresponding proximity of individual tile fields in the centre area of the townsite

tends to adversely affect the quality of the ground water which is the principal source of domestic water supply in Armstrong.

All of the wells sampled, which are presently in normal daily use, were free of fecal coliform organisms at the time of the survey. Only one of these wells was noted to contain coliforms of a non-fecal variety. However, samples collected from these wells at various times in recent years have been noted to contain fecal coliform bacteria which is indicative of the presence of human and/or animal wastes.

Two wells which are no longer used by the residents were sampled and found to contain large numbers of coliform organisms, of which none were of fecal origin, indicating that these bacteria are not associated with human or animal wastes.

LOCAL WATERCOURSES

There are two local watercourses which flow through the townsite. A tributary to Hoodoo Creek flows through the north end of the community in a south easterly direction. The other watercourse known as Armstrong Creek flows in a southerly direction through the south west area of the townsite. Hoodoo Creek, itself, does not flow through the community. The appended map shows the location of these watercourses.

Both Armstrong Creek and the tributary to Hoodoo Creek were sampled for bacteriological examination and chemical analyses at locations within the developed area of the community.

1) Tributary to Hoodoo Creek

Samples were collected from the tributary at seven locations which are labelled on the map as locations one to seven inclusive. The appended laboratory results indicate that the bacteriological quality of the water remains relatively constant throughout the community with total coliform counts ranging between 92 and 292 organisms per 100 ml. of sample. A fecal coliform count of eight was present in the sample collected at location one. Samples from locations two to seven inclusive revealed fecal coliform counts of less than four organisms per 100 ml. of sample which does not indicate the presence of raw sanitary or septic tank wastes in the watercourse.

Fecal streptococci counts were also performed on the above samples. In all cases the ratio of fecal coliform organisms to fecal streptococci was unity or less indicating that the small amount of fecal matter present in the stream was most likely due to the presence of animal rather than human wastes. The maximum value of 292 total coliforms was obtained from a sample collected at the most downstream location (#7). However, the relatively narrow range of values (200) obtained over the seven locations indicates that no major degradation of water quality is occurring between the location at which the streamwater enters the community and the location at which it flows away from it. The fact that there was no increase in the fecal coliform counts at any of the downstream sample locations indicates that sanitary wastes are not gaining access to the stream.

Samples were also collected for chemical analysis at sample locations one, three and five. The analysis results showed phenols to be present in a concentration of 2ppb (parts per billion) in each sample, which is not an abnormal level for natural watercourses. Low concentrations of phenols may be caused by decaying vegetation in streams and other natural causes. Additional samples collected for B.O.D. (biochemical oxygen demand) analysis at locations upstream and downstream of the developed area of the community revealed demands of 2.0 ppm upstream and 1.6 ppm downstream. These values are normal for natural watercourses and do not indicate the occurrence of any impairment of the stream due to oxygen demanding wastes.

A sample collected at location No. 9 is from Hoodoo Creek immediately prior to it's confluence with the tributary. The laboratory results revealed water quality characteristics similar to those of the tributary.

2) Armstrong Creek

Stream water samples were collected from locations No. 11 to 14 inclusive for bacteriological examination and chemical analyses.

The laboratory results indicate that samples collected at locations 11 and 12 contained total coliform counts of 24 and 28 organisms per 100 ml. respectively. Fecal coliform and fecal streptococci counts of less than four per 100 ml. of each sample were present in samples from each of these locations. The phenols concentration at location 11 was only 4 ppb which is not unnatural for surface waters. These examination and analyses results suggest that the

stream is relatively free of impairment at it's point of entry to the community near the Caribou Lake Road. However, downstream of the Caribou Lake Road culvert the stream meanders behind five inhabited dwellings. A sample collected from location No. 13 was noted to contain a slightly higher count of 352 total coliforms of which 20 were of fecal origin. Less than four fecal streptococci were present in the sample. These results yield a 20:1 ratio of fecal coliforms to fecal streptococci which suggests that a small amount of fecal matter which may be entering the stream is probably of human as opposed to animal origin.

There were no visible signs of malfunctioning septic tank systems in the vicinity of Armstrong Creek. However, pit privies are located between the creek and a few of the homes located on the north side of McKenzie Lake Road. The increase in bacterial counts indicate that domestic wastes may be gaining access to the creek in the form of leachate. The near saturated condition of the soil in this area at the time of survey due to spring runoff conditions would tend to aid the process of transferring such wastes to the creek.

Samples collected further downstream in Armstrong Creek at location #14 contained similar bacterial counts. The B.O.D. of the stream water at this location was analytically determined to be 0.4 ppm which is not unusual for surface waters.

DISPOSAL OF SEPTIC TANK WASTES

A septic tank pumpout service is available to the residents of the community.

The septic sludge is trucked by a private contractor to an abandoned gravel borrow pit located approximately two miles north-west of the community. This disposal site was inspected during the survey at which time it was clearly marked with a sign which read "Danger - Septic Wastes."

The location of the site is remote from any developed areas and appears to be satisfactory from this Ministry's point of view.

REFUSE DISPOSAL

A refuse collection service is available on an individual contract basis. Garbage is disposed of in an open pit dump located three miles north of the community adjacent to Airport Road.

DISCUSSION

The Community of Armstrong can be considered as a typical Northern Ontario problem area which is difficult to correct under normal available legislation, due to the fact that there is no formally organized form of municipal government to assume responsibility for the proper allocation and repayment of funds made available through financial assistance from the province.

This Ministry is aware of the continuing problem of bacterial contamination and water shortages which plague several of the individual shallow well supplies in Armstrong at various times of the year. Generally speaking this is caused by unsuitable well location, and inadequate construction and maintenance practices.

Some of these private wells, have been contaminated by petroleum hydrocarbons as the result of a gasoline spill within the community during December of 1972.

Based on preliminary investigations the most economically feasible alternative available for the provision of a potable communal water supply system appears to be the acquisition and expansion of the existing C.N. water works system.

Staff have for many years attempted to find a method under which we can proceed with the development of programmes in the unorganized townships. Unfortunately, we are confined within the Act to the development of programmes for municipalities or "persons". Such a requirement provides us with some assurance that the costs incurred could be recovered. We do not have any funds available which can be given as unconditional grants for emergency situations or otherwise.

Some co-ordination among the various Ministries involved should be effected. This Ministry has always indicated its willingness to assist in providing technical expertise in the design of water and sewage systems and of the supervision of any construction involved. As we have noted, however, we are unlike other Ministries which are able to provide direct funding or grants without having to concern themselves over arrangements for the recovery of such funds.

SUMMARY

A water pollution survey was conducted within the unorganized community of Armstrong on May 14 and 15, 1973.

Roadside ditches throughout the community were dry and noted to contain litter and debris. However, no signs of septic tank effluents or raw domestic wastes were evident.

The majority of the homes within the community are poorly constructed and in need of general repairs. Several of the lots contained considerable amounts of discarded material including domestic refuse and abandoned automobiles and household appliances.

Sanitary wastes are disposed of on an individual basis by means of septic tank and tile field systems and pit privies.

Domestic water is obtained in most cases on an individual basis from shallow dug wells. Some of the residents carry water for laundry purposes only from Armstrong Creek and the Hoodoo Creek tributary. A few of the more recently constructed homes in the vicinity of the railway station obtain water from the C.N. water works.

Stream sample results suggest that domestic wastes are not gaining access to the Hoodoo Creek tributary. However, the slight increase in bacterial counts in Armstrong Creek between sample locations 12 and 13 suggest that small volumes of sanitary wastes may be gaining access to the creek in the form of leachate from septic tank systems and/or pit privies located nearby.

JWG/br

J. W. Gilhooly, Technologist

DISTRICT OF THUNDER BAY

COMMUNITY OF ARMSTRONG

Bacteriological examination and chemical analyses results of stream water samples

Sample Location No.	Fecal Coliform Count	Fecal Streptococci Count	Total Coliform Count	BOD ₅	Phenols In P.P.B.
1	8	8	192	2.0	2
2	<4	<4	176		
3	<4	4	116		2
4	<4	<4	100		
5	<4	<4	92		
6	<4	4	124		2
7	<4	<4	292		
8	<4	<4	116	1.6	0
9	<4	<4	72	0.6	6
10	<4	<4	<4		
11	<4	<4	24		4
12	<4	<4	28		
13	20	<4	352		2
14	4	4	284	0.4	

DISTRICT OF THUNDER BAY

COMMUNITY OF ARMSTRONG

Bacteriological examination and chemical analyses
results of local water supplies

Sample Location No.	Fecal Coliform Count	Fecal Streptococci Count	Total Coliform Count	Phenols In P.P.B.	Comments
15	1	1	1		Spring fed pond
20	0	0	0	0	C.N.R. Station (Surface water)
21	0	0	0	2	Min. of Natural Resources (Well)
22	0	0	0	2	Armstrong Public School (South Well)
23	0	0	0	2	Armstrong Public School (North Well)
24	0	0	0	0	Cotie Residence (Well)
25	0	0	0	0	Therrien Residence (Well)
26	0	0	2	30	A. Bilski Residence (Well)
27	0	8	1800	4	Abandoned Communal Well
28	0	6	256	6	Abandoned Private Well
29	0	0	0	0	Bilski Sr. Residence (Well)
30	0	0	0	0	Mabee Residence (Well)
31	0	0	0	0	H. King Residence (Well)
32	0	0	0	4	Rodway Residence (C.N.R. Supply)

